Brief

Climate change impacts on health:
Myanmar assessment

January 2025

Climate Centre

Introduction

Myanmar faces severe threats from climate change, ranking second among the countries most vulnerable to extreme weather events, according to the Global Climate Risk Index (2021). Frequent heatwaves, floods and cyclones, along with rising sea levels, have significantly impacted human health, livelihoods, food security and land availability. Compounding these risks is ongoing armed conflict, which has exacerbated climate-sensitive health conditions by worsening socio-economic factors and pushing poverty levels to alarming heights (World Bank Group, 2024).

This report[1] focuses on understanding how interconnected factors exacerbate the health impacts of climate change, particularly for vulnerable populations. Building on the 2021 *Climate Change Impacts on Health and Livelihoods: Myanmar Assessment*, it aims to inform effective responses to protect the health of those most at risk. It offers recommendations to strengthen humanitarian efforts within the International Red Cross and Red Crescent Movement and through collaboration with external stakeholders. This review is the result of a close collaboration between the Myanmar Red Cross Society, the Finnish Red Cross and the International Federation of Red Cross and Red Crescent Societies (IFRC), with technical support from the Red Cross Red Crescent Climate Centre.

1. Climate hazards and variability

Myanmar has a tropical climate with three seasons: a cool winter, a hot summer and a rainy season dominated by the southwest monsoon. Rainfall varies greatly across the country, with the central dry zone receiving the least and coastal areas such as Rakhine State receiving the most (NAPA, 2012).

Temperatures will continue to rise: Temperatures rose by about 0.25°C per decade from 1981 to 2010, with inland areas warming faster than coastal regions. Temperatures are projected to rise by a further 0.7–1.1°C by 2040, and could accelerate to reach as much as 1.3–2.7°C higher by the 2070s. Inland regions, particularly the eastern and northern hilly areas, will see the most dramatic warming (Horton *et al.*, 2017).

Rainfall is increasing in coastal areas: Between 1981 and 2010, coastal areas experienced a significant increase in rainfall, with an additional 157mm per decade, accounting for 4.5 per cent of the annual total, primarily during the dry season (ibid.). Wet season rainfall is projected to rise, intensifying flood risks in certain areas. Annual rainfall is also expected to increase further, especially in Rakhine State, while inland areas are likely to see more moderate changes (WBGCCKP, 2021).

1 This report employed a qualitative methodology, prioritising in-depth insights over numerical data. Semi-structured interviews were conducted to gather rich, nuanced data, allowing for flexibility in exploring interviewees' experiences. A significant limitation was the unavailability of up-to-date epidemiological data. To address this, insights were triangulated by cross-referencing interview data with existing literature and reports published since 2021, ensuring the findings reflect current trends and perspectives.

Myanmar will be impacted by sea-level rise: Sea levels have been rising globally and are expected to rise by at least 0.6–1.1 metres by 2100 under high-emission scenarios (Oppenheimer *et al.,* 2019). Since Myanmar's coastline consists of large low-lying areas, including the Ayeyarwady Delta, those sea-level rise projections will result in the submergence of a large portion of its coastal areas (Horton *et al*., 2017).

Cyclones and extreme heat events will occur more frequently: Cyclones and extreme heat days have been increasing since the 1990s and are increasingly impacting human health. Cyclones, which used to strike on average once every three years, are now an annual occurrence. The number of extremely hot days per month is projected to rise by a further 3–6 days by the end of this decade, and by as many as 7–17 days by the 2050s (Horton *et al*., 2017).

2. Whose health is most at risk?

Internally displaced persons (IDPs)

Displaced populations in Myanmar face significant barriers to accessing healthcare due to ongoing conflict, including limited medical facilities, supply shortages and restricted movement (Kyungmee Kim, 2024). As of December 2024, approximately 3.49 million IDPs are concentrated in conflict zones, with 36.1 per cent in Sagaing Region and 15.1 per cent in Rakhine State (UNHCR, 2024). Cyclone Mocha in 2023 exacerbated displacement and prevented access to healthcare, especially among Rohingya communities and other ethnic groups in Rakhine State, while causing agricultural damage and food insecurity in IDP-hosting areas (IDMC, 2023). WHO and partners addressed acute watery diarrhoea outbreaks in these areas amid severe shortages of medicine and funding, worsened by logistical challenges (WHO Health Cluster, 2024).

Low-income households

By the end of 2023, nearly half the population lived below the poverty line of 1,590 Myanmar kyats (MMK) per day (0.75 US dollars or 0.68 euro) (UNDP, 2024). Poverty rates have doubled over the last six years, with one-third of the population economically insecure due to displacement, unemployment and the rising informality of the economy (World Bank Group, 2024). Import restrictions, transportation challenges, decreased production, increased prices for goods, agricultural disruptions and reduced access to livelihood opportunities, particularly in rural areas, further exacerbate the situation for low-income families (IFRC, 2024).

Climate disruptions have worsened conditions for farming households, increasing food prices and forcing people to adopt negative coping strategies like sale of assets and reduced spending on food (Myanmar Agriculture Policy Support Activity, 2024). This has led to deteriorating food security and malnutrition, with diets low in nutrients and high in nutrient-poor foods causing undernutrition in children and obesity in adults (Tauseef et al., 2024). Women in the poorest households are disproportionately affected, with rural women tending to be underweight and urban women overweight (UN Women, 2024).

3. How will health be affected by climate change?

Extreme heat and mortality

Extreme heat threatens the physical health of vulnerable populations such as labourers, elderly people, children and those with pre-existing health conditions (Jordan, 2023). It also impacts mental health, leading to increased rates of suicide and violence (ibid.). IDPs and low-income households are particularly affected due to inadequate shelter. High temperatures during heatwaves are especially life-threatening in the central dry regions. According to the Department of Meteorology and Hydrology, the highest temperatures in Myanmar since record-keeping began 56 years ago were recorded in 2024 in Naung-U, Minbu and Sagaing (IFRC, 2024a). Although official reports are lacking, media sources indicate several heat-related deaths (ibid.).

Air pollution

Yangon and Mandalay have the highest air pollution concentrations in Myanmar, making the country's air pollution nearly twice as deadly as that of its neighbours (Raitzer et al., 2015). The combined threats of extreme heat and air pollution are concerning, particularly in Myanmar where both are expected to increase with climate change. Extreme heat events are associated with stagnant air, which traps pollutants and increases surface-level ozone. Children aged 5–14 are particularly vulnerable to the impacts of air pollution; particulate matter pollution is the leading risk factor for deaths in this age group (UNESCAP, 2019).

Vectorborne diseases

Dengue fever is endemic to Myanmar, with a cyclical pattern linked to its seasons and rainfall. A recent study demonstrated the association between mean temperature increase and the incidence of dengue in Myanmar, highlighting a correlation between climate change and infectious disease transmission (Anwar et al., 2019). Climate change also exacerbates vectorborne diseases following large-scale weather events such as cyclones and floods. Furthermore, malaria cases – including from the multidrug-resistant form of the parasite – have increased in Myanmar due to climate change (WHO, 2014).

Waterborne diseases

In Myanmar, water quality is expected to decline due to desertification, rising temperatures and reduced rainfall in the central dry zone, and also due to saline intrusion and flooding in coastal and urban areas, where poor communities already face significant challenges. Myanmar suffers from a heavy burden of waterborne disease, particularly during the rainy season and flooding events (Roobthaisong *et al.,* 2017). In 2024, Myanmar reported an increased number and spread of cases of acute watery diarrhoea, and some laboratory-confirmed cholera cases (WHO, 2024).

Malnutrition

Micronutrient deficiencies in Myanmar contribute to up to 6 per cent of deaths of children under five, with poor rural households having the least access to nutritious food (MONREC, 2019). Although stunting rates are improving, nearly a quarter of children remain stunted, with rates of up to 41 per cent in areas where poverty is highest (UN IGME, 2023). Babies born in Myanmar are 44 per cent less likely to be of average size, potentially due to maternal malnutrition during pregnancy. Agricultural, fisheries and livestock products contribute to the nutritional security of both rural and urban populations. The impacts of climate change on these primary sectors, exacerbated by conflict and economic crisis, threaten the nutritional standards of the population – especially for women and children.

Critical infrastructure and health systems

The healthcare system, particularly in areas like Rakhine State, has suffered severe damage due to increased attacks on health facilities, blockades of medical supplies and assaults on healthcare workers. The political situation following the February 2021 military intervention has led to the destruction of infrastructure, loss of medical personnel and a crisis in an already fragile system. Many households, including 70 per cent of non-displaced stateless households and 40 per cent of IDPs, lack adequate access to healthcare (UN OCHA, 2023). This increases morbidity, including from preventable diseases, and mortality (ibid.).

Extreme weather events and access to healthcare

In remote areas such as Chin, Sagaing, Magway and Kachin, healthcare infrastructure remains scarce due to ongoing conflict and challenging terrain. Regions like Ayeyarwady and Tanintharyi on the south coast, as well as eastern Shan State, are particularly vulnerable to climate risks due to their exposure to cyclones and storms. IFRC estimated in September 2024 that more than 630,000 people have been affected by floods and landslides across nine states and regions, including through diminished access to healthcare. An estimated 7.1 million vulnerable people reside in affected areas, including 500,000 IDPs, where food insecurity and flooding exacerbate their vulnerability (WFP, 2024).

4. Recommendations to national and international actors

- **Strengthen health systems in general and make them climate resilient.** Health workers and volunteers should be trained on and equipped for the health impacts of climate change, while protecting them from conflict-related stigmatization and harassment. Communities at risk from climate-induced health threats, such as shifting patterns of vectorborne and waterborne diseases, should be supported through community-based health vulnerability assessments that account for seasonal changes in disease incidence. Additional strategies include developing early warning systems for environmental risks and improving community-level surveillance that can contribute to monitoring the incidence of climate-sensitive diseases.

- **Provide access to essential medicines and medical supplies as a critical measure to reach climate-sensitive health outcomes.** This includes medicines for emergency treatments, malaria and waterborne diseases like cholera and acute watery diarrhoea, as well as treatments for non-communicable diseases and routine vaccinations. Scaling up these interventions is imperative in districts facing the combined effects of remoteness, conflict, vulnerability to climate shocks and long-term climate changes. Such efforts are pivotal in reducing mortality and complications from climate-sensitive diseases.

- **Put the most vulnerable and at-risk people at the centre of actions.** To reduce climate-related health risks among IDPs and low-income households in regions and states like Sagaing, Rakhine, Magway, Kayin, Kachin, Tanintharyi and Bago, a targeted and sustainable approach is vital. Actions must incorporate local knowledge, participatory risk assessments and community involvement in decision-making, monitoring and evaluation. Localized vulnerability analyses can help ensure that activities address priority health needs linked to climate impacts.

- **Make locally led adaptation the foundation for addressing climate-sensitive health risks.** The role of health workers, community health workers, Red Cross volunteers and communities must be strengthened, as they are key actors on the ground and most knowledgeable about changing climate risks and how these affect local populations. Their capacities and resources should be reinforced to enable them to act in anticipation of health threats, providing solutions proactively to prevent more severe consequences. When community members lead in creating and maintaining their own climate solutions, they become more engaged and take more initiative. This approach cultivates resilience from within, thereby ensuring communities are better prepared for climate-related health challenges.

- **Pave the way for dialogue between civil society and the government on the Health National Adaptation Plan (HNAP) to highlight community-level perspectives and climate–health linkages.** Community-based data and case studies linking health to climate change contribute to the HNAP process and enhance its implementation at national and subnational levels. Engaging with multiple government agencies can break silos and strengthen adaptation programmes, while community engagement and participation in planning and outcome monitoring will support sustainable, long-term interventions.

Bibliography

Anwar, A., Khan, N., Ayub, M., Nawaz, F., Shah, A., & Flahault, A. (2019). Modeling and Predicting Dengue Incidence in Highly Vulnerable Countries using Panel Data Approach. *Int J Environ Res Public Health.* Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC6650977/.

Horton, R., De Mel, M., Peters, D., Lesk, C., Bartlett, R., Helsingen, H.,... Rosenzweig, C. (2017). *Assessing Climate Risk in Myanmar: Technical report*. Retrieved from https://unhabitat.org/sites/default/files/2019/10/assessing-climate-risk-in-myanmar_technical-report.pdf

IDMC. (2023). *Country Profile – Myanmar.* Internal Displacement Monitoring Centre. Retrieved from: https://www.internal-displacement.org/countries/myanmar/#internal-displacement.

IFRC. (2024). *Myanmar 2024–2026 IFRC network country plan.* IFRC. Retrieved from ReliefWeb: https://reliefweb.int/report/myanmar/myanmar-2024-2026-ifrc-network-country-plan.

IFRC. (2024a, May 14). *Searing temperatures sweep like fire across Asia Pacific, causing distress for millions.* Retrieved from ReliefWeb: https://reliefweb.int/report/bangladesh/searing-temperatures-sweep-fire-across-asia-pacific-causing-distress-millions.

Jordan, R. (2023, August 14). *Experts discuss how extreme heat affects vulnerable populations – and how communities and health care systems can respond.* Retrieved from StanfordReport: https://news.stanford.edu/stories/2023/08/heat-affects-vulnerable.

Kyungmee Kim, E. (2024). Concurrent Challenges of Conflict and Climate Change in Myanmar. *Georgetown Journal of International Affairs*, https://gjia.georgetown.edu/2024/06/09/concurrent-challenges-of-conflict-and-climate-change-in-myanmar/.

MONREC (The Ministry of Natural Resources and Environmental Conservation). (2019). *Myanmar Climate Change Strategy (2018-2030)*. Retrieved from https://myanmar.un.org/sites/default/files/2019-11/MyanmarClimateChangeStrategy_2019.pdf.

Myanmar Agriculture Policy Support Activity. (2024). *Shocks and coping: Findings from the sixth round of the Myanmar Household Welfare Survey (June – November 2023)*. Washington, DC: International Food Policy Research Institute.

NAPA. (2012). *Myanmar National Adaptation Programme of Action (NAPA) to Climate Change.* Retrieved from Global Heat Health Information Network: https://ghhin.org/resources/myanmar-national-adaptation-programme-of-action-napa-to-climate-change/.

Oppenheimer, M. B.-E.-J. (2019). Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities. In: *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate.* Cambridge University Press, Cambridge, UK and New York, NY, USA. Retrieved from https://www.ipcc.ch/srocc/chapter/chapter-4-sea-level-rise-and-implications-for-low-lying-islands-coasts-and-communities/.

Raitzer, D., Samson, J. N., & Nam, K.-Y. (2015, Dec 31). Achieving Environmental Sustainability in Myanmar. *Asian Development Bank Economics Working Paper Series.* Retrieved from https://www.adb.org/sites/default/files/publication/177586/ewp-467.pdf.

Roobthaisong, A., Okada, K., Htun, N., Aung, W. W., Wongboot, W., Kamjumphol, W.,... Hamada, S. (2017). Molecular Epidemiology of Cholera Outbreaks during the Rainy Season in Mandalay, Myanmar. *The American Journal of Tropical Medicine and Hygiene*, 1323–1328. Retrieved from https://pmc.ncbi.nlm.nih.gov/articles/PMC5817772/.

Tauseef, S., Oo, T., & Masias, I. (2024). *Assessing diet quality and anthropometry: Key indicators and insights.* Washington, DC: International Food Policy Research Institute. Retrieved from https://hdl.handle.net/10568/148761.

UN IGME. (2023). *Levels and Trends in Child Mortality.* United Nations Inter-Agency Group for Child Mortality Estimation. Retrieved from UNICEF: https://data.unicef.org/resources/levels-and-trends-in-child-mortality-2024/.

OCHA. (2023). *Myanmar Humanitarian Needs and Response Plan 2024*. United Nations Office for the Coordination of Humanitarian Affairs. Retrieved from https://reliefweb.int/report/myanmar/myanmar-humanitarian-needs-and-response-plan-2024-december-2023-enmy.

UN Women. (2024). *Asean Gender Outlook 2024.* Retrieved from https://data.unwomen.org/publications/asean-gender-outlook-2024.

UNDP. (2024, April). *Poverty and the household economy of Myanmar: a disappearing middle class.* United Nations Development Programme. Retrieved Sept 2024, from United Nations Development Programme: https://www.undp.org/publications/poverty-and-household-economy-myanmar-disappearing-middle-class.

UNESCAP. (2019). *The Disaster Riskscape Across Asia-Pacific: Pathways for resilience, inclusion and empowerment.* Retrieved from https://www.unescap.org/publications/asia-pacific-disaster-report-2019.

UNHCR. (2024). *Myanmar*. UNHCR Operational Data Portal. Retrieved from https://data.unhcr.org/en/country/mmr.

WBGCCKP. (2021). *Myanmar Climate Projections – Mean projections.* World Bank Group. Retrieved from World Bank Group Climate Change Knowledge Portal: https://climateknowledgeportal.worldbank.org/country/myanmar/climate-data-projections.

WFP. (2024). *WFP launches emergency food assistance for flood-affected people in Myanmar.* World Food Programme. Retrieved from https://www.wfp.org/news/wfp-launches-emergency-food-assistance-flood-affected-people-myanmar.

WHO. (2014). *WHO Country Cooperation Strategy Myanmar 2014–2018.* Retrieved from https://www.who.int/publications/i/item/9789290224495.

WHO. (2024). *Myanmar Acute Watery Diarrhea / Cholera Outbreak External Situation.* Retrieved from https://cdn.who.int/media/docs/default-source/searo/whe/him/20240827_myanmar-awd-cholera-sitrep.pdf?sfvrsn=67908752_3&download=true.

WHO Health Cluster. (2024). *Myanmar Health Cluster Bulletin Q2 2024.* Retrieved from Health Cluster: https://healthcluster.who.int/publications/m/item/myanmar-health-cluster-bulletin-q2-2024.

World Bank Group. (2024). *Threat to livelihoods deepens as economic outlook remains weak.* Retrieved from https://www.worldbank.org/en/news/press-release/2024/06/12/threat-to-livelihoods-deepens-as-myanmar-economic-outlook-remains-weak.


Climate
Centre